

Smart Solutions for Smart Cities

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Agenda

- ✓ The cities' everyday life from an innovative and analytical point of view
- ✓ LBASense, the location-based technology that enables Smart City concept
- ✓ Data-as-a-Service and OpenData initiative in Singapore



What we do

Smart Cities Installations

- Barcelona
- Bern
- Liverpool
- Prague
- Skellefteå
- Singapore



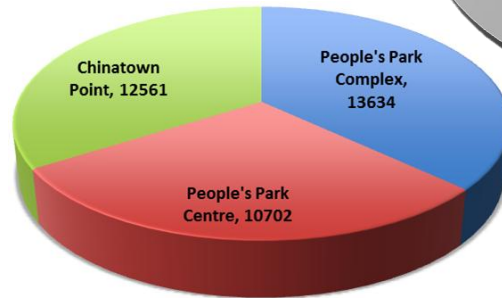
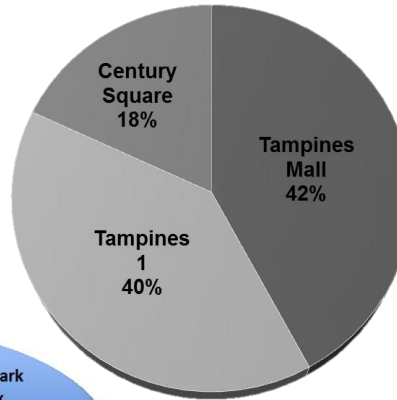
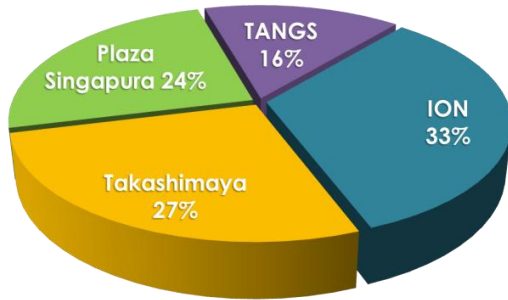
Malls' Census in Singapore



✓ Daily unique visitors on weekly basis



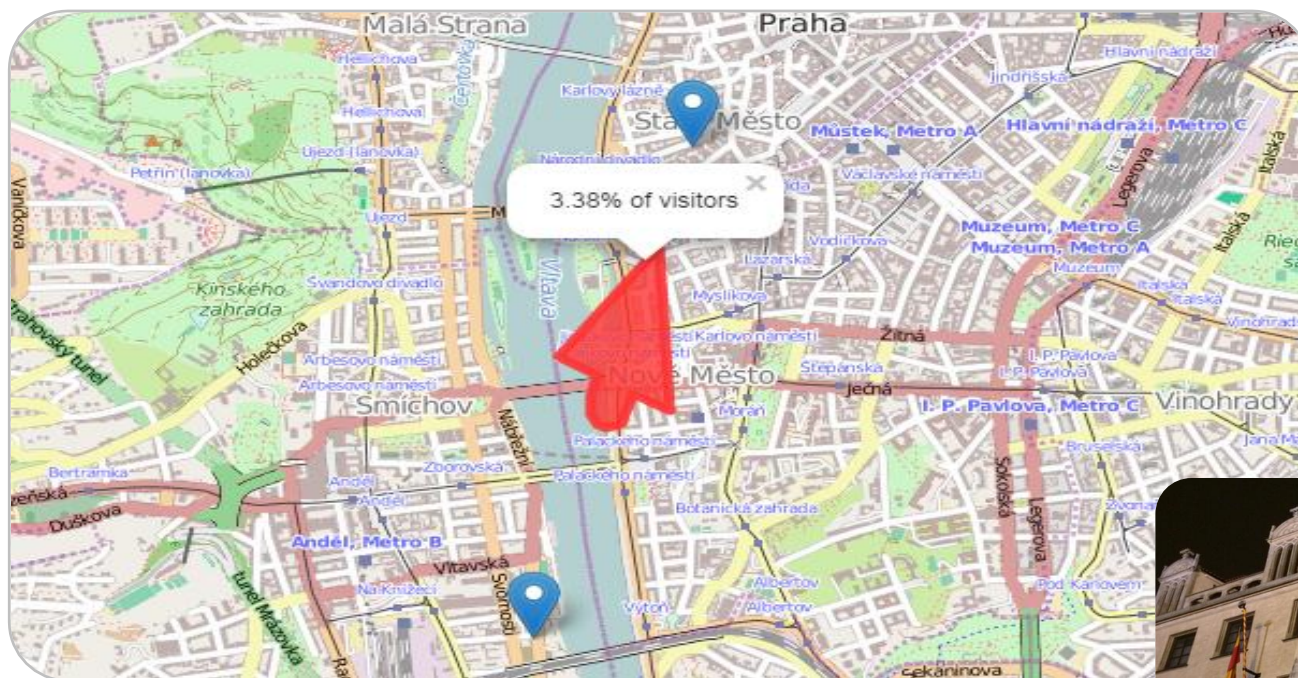
Competitive Analysis



- ✓ Performance comparison among commercial districts, events, etc.



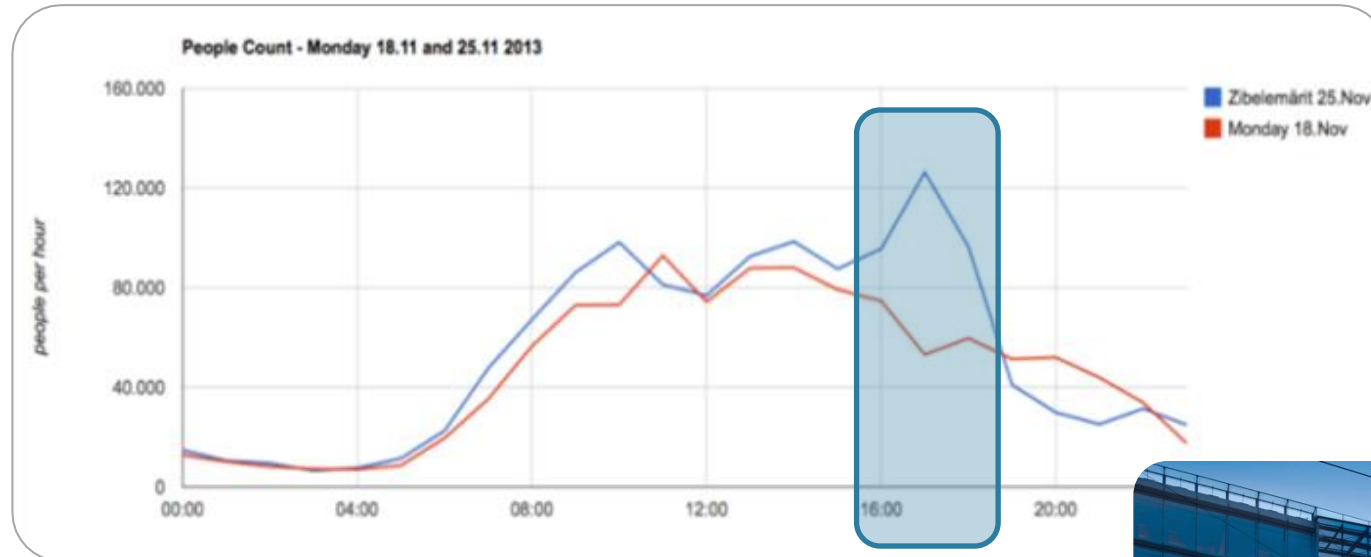
Mobility in Prague



- ✓ People's flow among areas of interest, i.e. touristic attractions, commuters key-points, etc.



Anomaly Detection in Bern



- ✓ Train accident at 15:30 (25.11.2013) caused a jammed station for about 2h



Tourists' Survey in Barcelona



- ✓ Analysis of tourists' population and behaviour





How LBA Sense Works

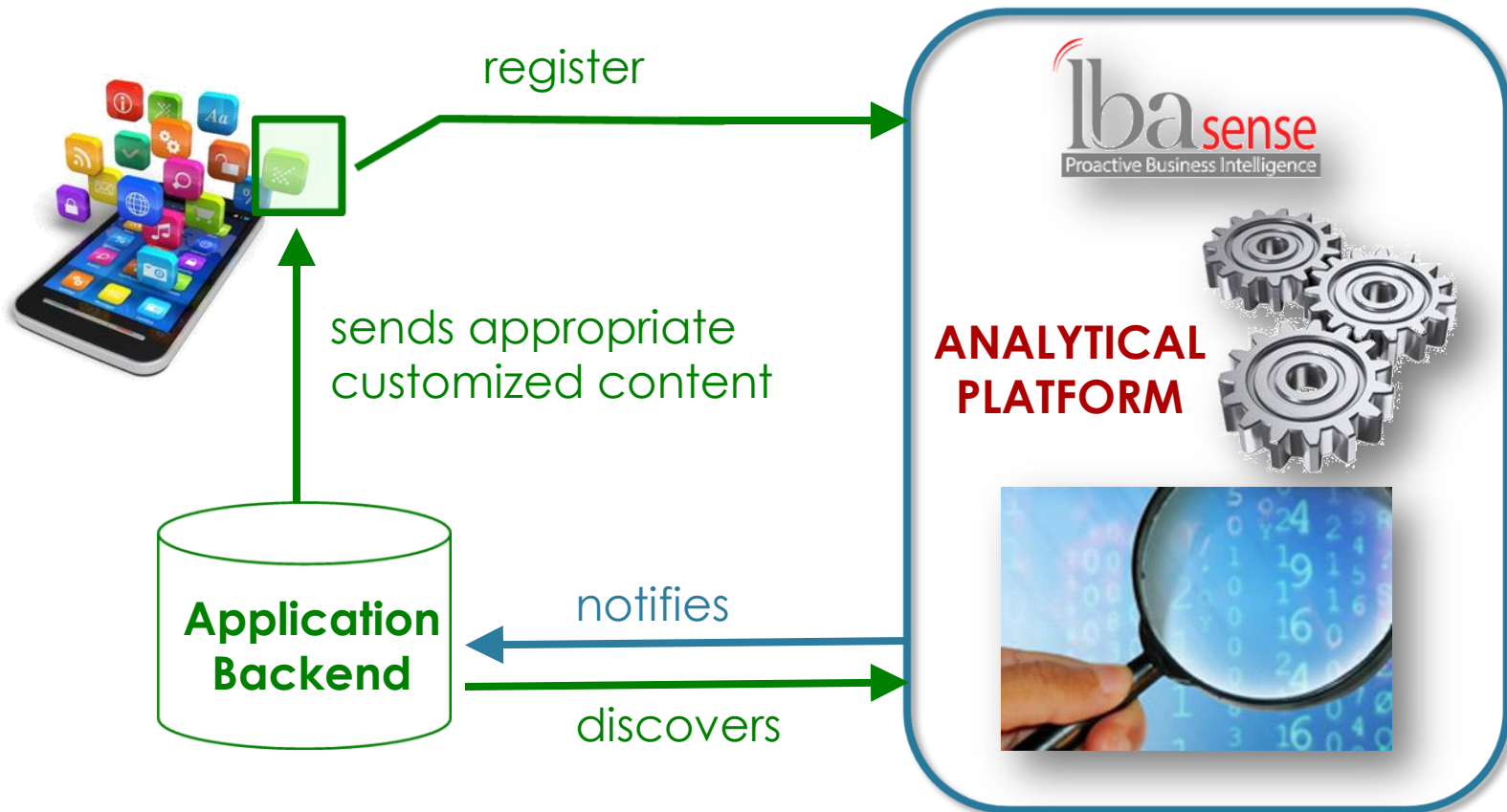
What is LBASense?

- Network of long-range and short-range mobile phone sensors
- Sensors' fusion enables high accuracy measurements of footfall, mobility and activity pattern on a citywide scale
- APIs provide mobile application developers with an easy method to enrich analytics



Architecture

MOBILE APP ↔ LBASENSE BACKEND WORKFLOW





DaaS Singapore

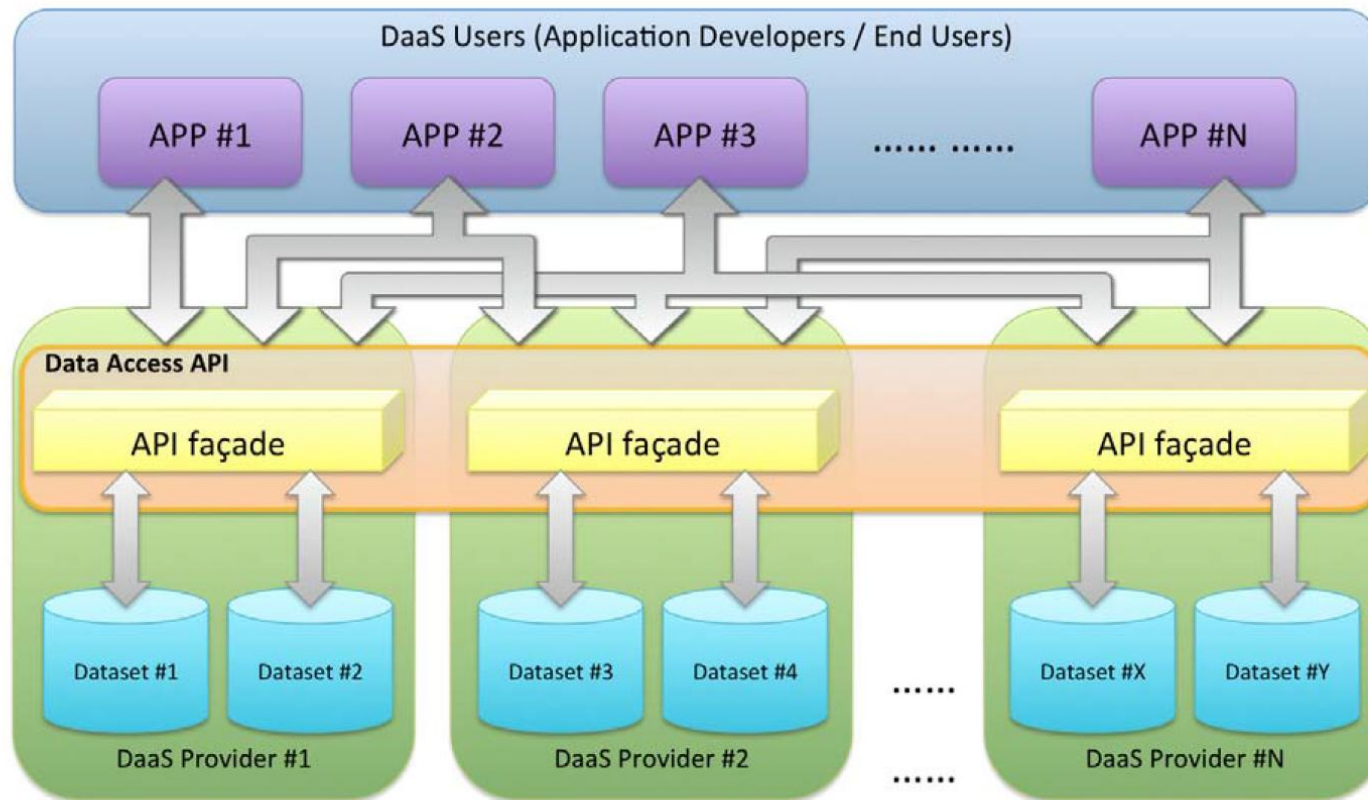
Data-as-a-Service in Singapore

- Two similar initiatives:
 - Open data for government
 - Open data for private sector
- The government takes the role of standard creator and promoter of use cases
- Part of Singapore's Smart Nation Initiative
- Main goal is to make Singapore the Asia data hub
- Open data does not mean free data !

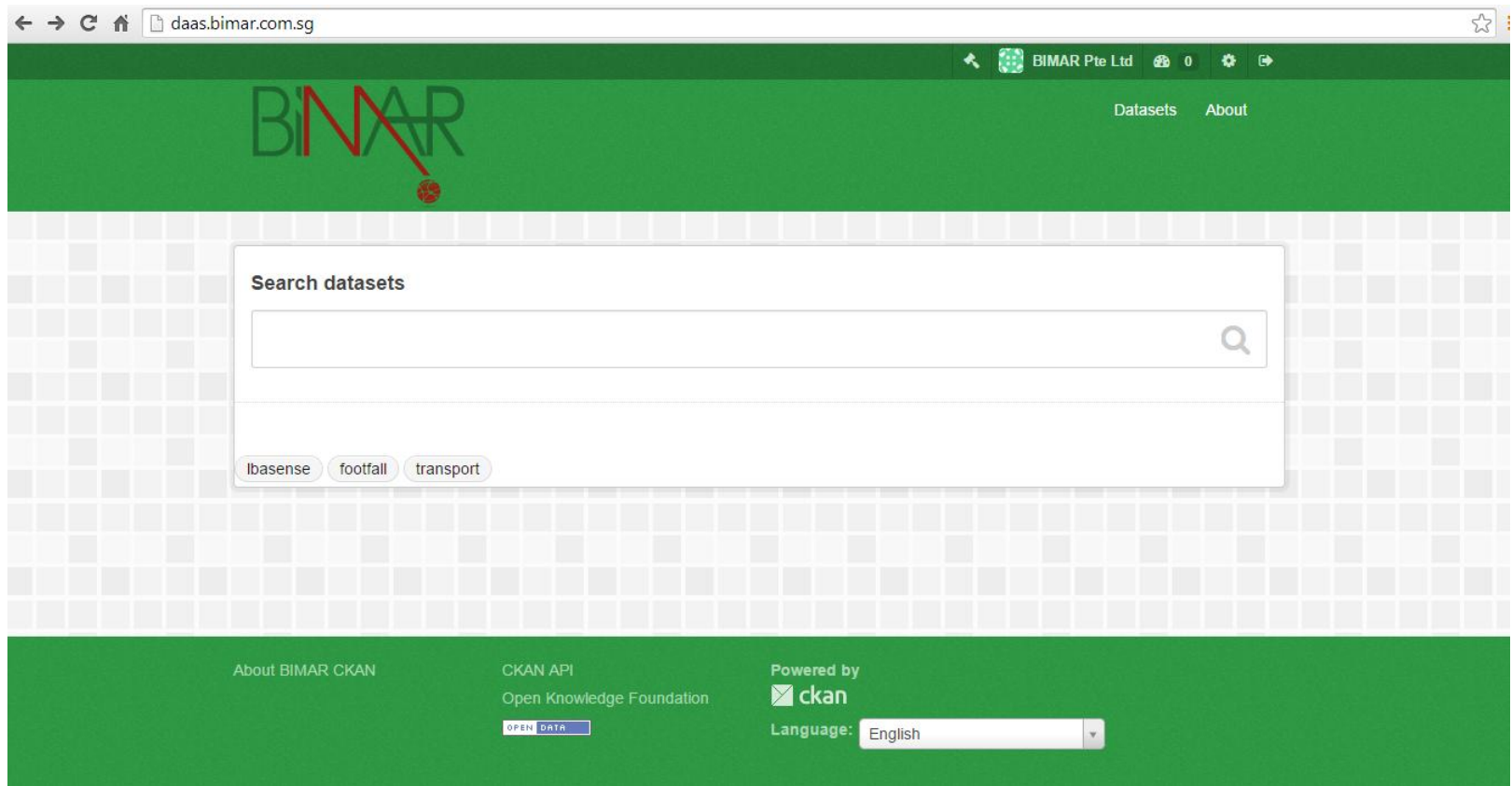
Standard TR33 : 2013

- *“Data-as-a-Service allows organizations to share, commoditise or monetise data as an on-demand service.”*
- Data-as-a-Service (DaaS) application programming interface (API) design and implementation
- Users may, directly or through applications, analyse, process, combine and present these data as information or as part of other value-added services
- Main focus onto APIs, not data files themselves

Infrastructure



Common Search Engine



The screenshot shows a web browser window with the address bar displaying "daas.bimar.com.sg". The page has a green header with the "BIMAR" logo and navigation links for "Datasets" and "About". A central search box is titled "Search datasets" and contains a search input field with a magnifying glass icon. Below the input field are three filter buttons: "ibasense", "football", and "transport". The footer is green and contains links for "About BIMAR CKAN", "CKAN API Open Knowledge Foundation" with an "OPEN DATA" button, and "Powered by ckan" with a language dropdown menu set to "English".

daas.bimar.com.sg

BIMAR Pte Ltd 0

Datasets About

BIMAR

Search datasets

ibasense football transport


About BIMAR CKAN

CKAN API
Open Knowledge Foundation
OPEN DATA

Powered by
ckan
Language: English

Common Search Engine



 / Datasets

Advanced Filter Options...

6 datasets found from 4 data providers

Singapore Hydrodynamic Hindcast Model - L Model

Paid

This dataset is a detailed hydrodynamic local model of Singapore and updated weekly. The model has been run operationally, calibrated and validated since 2003 using a rich number of local currents measurements, both upward looking ADCPs (4-14 at any given time), ADCP transects (3-7 vessels on daily operations).

PNG

From: DHI Group

Population in Singapore shopping malls

Paid

Database of shopping malls in Singapore and related visiting population

CSV

From: Bimar

Keywords



singapore

Advanced Filter Options...

Data Provider	<input type="text" value="filter by Data Provider"/>	License	<input type="text" value="filter by License"/>
Format	<input type="text" value="filter by Format"/>	Tags	<input type="text" value="filter by Tag"/>
Free/Paid	<input type="text" value="filter by Free/Paid"/>		
SSIC Level 1	<input type="text" value="filter by SSIC Level 1"/>		
SSIC Level 2	<input type="text" value="Please select SSIC Level 2"/>		

standard

customised

Orchard Road Dataset

Number of people and tourists visiting Orchard Rd every hour

Followers
0

Social

Google+

Twitter

Facebook

License

Other (Not Open)

Dataset

Groups

Activity Stream

Related

Number of people and tourists visiting Orchard Rd every hour

Number of people and tourists who visited Orchard Road, Singapore, per hour, over a 6-month period.

Data and Resources

CSV

Orchard Rd footfall sample

6-month footfall and tourists information in hourly basis about Orchard Road

Explore

footfall ibasense orchard tourists

Additional Info

Field	Value
Source	http://www.bimar.com.sg/wp-content/uploads/2014/09/Orchard_sample.csv
Author	BIMAR Pte Ltd
Maintainer	BIMAR Pte Ltd
1.0 Free/Paid	Paid
1.1 SSIC	M73
1.2 SSIC Level 1	Professional, Scientific and Technical Activities
1.3 SSIC Level 2	Advertising and Market Research
1.4 Quality Indicator 1: Total No. of Records	3638
1.5 Quality Indicator 2: No. of completely filled records/Total no. of records	1.00
1.6 Quality Indicator 3: No. of empty records/Total no. of records	0.00

Mobility Pattern Dataset

Distribution of people's movements in Singapore

Followers
0

Social

Google+

Twitter

Facebook

License


Other (Not Open)

DatasetGroupsActivity StreamRelated

Distribution of people's movements in Singapore

Distribution of people moving to/from the main areas of Singapore (north, south, central, east, west) along the main directions (north-south, east-west, etc). The matrix shows the percentages of people who flow from an area to another one, for all the possible combinations.

Data and Resources

 **Mobility activity in Singapore**
Percentages of people moving among the main areas of Singapore in all the...

Explore

Singaporebimarfootfalllbasensemobilitytransport

Additional Info

Field	Value
Source	http://www.bimar.com.sg/wp-content/uploads/2014/09/Mobility_sample.csv
Author	BIMAR Pte Ltd
Maintainer	BIMAR Pte Ltd
Version	1.1
1.0 Free/Paid	Paid
1.1 SSIC	M73
1.2 SSIC Level 1	Professional, Scientific and Technical Activities
1.3 SSIC Level 2	Advertising and Market Research
1.4 Quality Indicator 1: Total No. of Records	20
1.5 Quality Indicator 2: No. of completely filled records/Total no. of records	1.00
1.6 Quality Indicator 3: No. of empty	0.00

Shopping Malls Dataset

Population in Singapore shopping malls

Followers
0

Social

Google+

Twitter

Facebook

License

Other (Not Open)

Dataset Groups Activity Stream Related

Population in Singapore shopping malls

Database of shopping malls in Singapore and related visiting population

Data and Resources

Population in Singapore Shopping Malls Explore

Database of shopping malls in Singapore and related visiting population (in...

Additional Info

Field	Value
Author	BIMAR Pte Ltd
Maintainer	BIMAR Pte Ltd
1.0 Free/Paid	Paid
1.1 SSIC	M73
1.2 SSIC Level 1	Professional, Scientific and Technical Activities
1.3 SSIC Level 2	Advertising and Market Research
1.4 Quality Indicator 1: Total No. of Records	55
1.5 Quality Indicator 2: No. of completely filled records/Total no. of records	1.00
1.6 Quality Indicator 3: No. of empty records/Total no. of records	0.00
1.7 Quality Indicator 4: No. of fields per record	5
1.8 Quality Indicator 5: Dataset last update	04/10/2014 19:00
1.9 Quality Indicators last generated	04/10/2014 19:00

Other Companies' Datasets

Caveats

Free

Property caveats from Singapore Land Authority(SLA) includes private, landed, commercial and industrial properties.

CSV

From: SISVREALink

Corporate Financial Data from BizInsights

Financial data of 200,000 companies registered with Singapore Accounting and Corporate Regulatory Authority (ACRA) over the last 120 years

CSV

From: Elixir Tech

Real Estate Listing Data

Paid

Exclusive listings, Co-brokered Listings, and Advertisement Listings from online portals and newspapers.

XL SX

From: Streetsine

Real Estate Transaction Data

Paid

Only source of Sale/Rental Transactions from Estate Agents including private sale transactions, private rental transactions, HDB sale transactions, HDB rental transactions. Transaction data from public sources is also integrated.

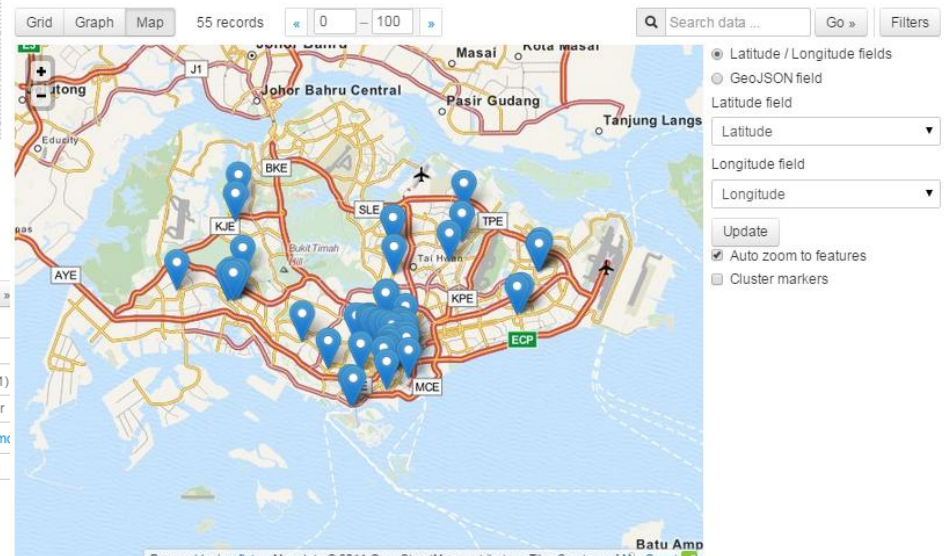
XL SX

From: Streetsine

Visualisation Tools

Grid Graph Map 1000 records « 0 – 100 »

date&time	no. of visitors	no. of tourists
6/1/2014 21:00	131202	18290
6/1/2014 22:00	97493	13590
6/1/2014 23:00	71869	10019



Reference Websites

- ✓ daas.bimmar.com.sg
- ✓ www.ida.gov.sg

Summary

- Singapore is unique in the way that the Government actively promotes the adaptation of DaaS to the industry
- Promotion is done via:
 - Standardisation
 - Deployment of single Singaporean catalog for DaaS
 - Financial support

Gracias



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